Qian Jiang

Coordinated Science Laboratory, 1308 W. Main Street Urbana, IL

✉ qianj3@illinois.edu 🌐 qianjiangcn.github.io in qianj3 ⓞ qianjiangcn

Education

Ph.D. Candidate in Electrical and Computer Engineering	**2019- Present**
University of Illinois at Urbana-Champaign (*UIUC*) *GPA:4.0/4.0*	*Illinois, USA*
Advisor: Professor Minh N. Do	
B.Sc. in Electrical Engineering	**2015 - 2019**
University of Electronic Science and Technology of China (*UESTC*) *GPA:3.9/4.0*	*Chengdu, China*

Research Interests

- Natural Language processing, Computer Vision, Generative Models, Multi-modal Learning, Foundation Vision-Language Models, Efficient Machine Learning.

Programming Skills

- Pytorch, Python, Matlab, Bash, Vim, Git.

Work Experience

Microsoft   **09/2023 - Now**
Research Intern, Multimodal Generative Modeling   *Seattle, USA*
- Working on diffusion-based modeling with extensions into text-controlled video generation.
- Developing efficient text-to-video fine-tuning approaches.
- Preparing paper submissions.

Amazon   **05/2023 - 08/2023**
Applied Scientist Intern, Large-scale Models for Relevance Matching   *Seattle, USA*
- Developed approaches using language models for product relevance matching for Amazon internal dataset and improved the internal benchmark over 4% on NDGC.
- Developed stochastic approach for contrastive learning with noises on public benchmarks (CC3M, ImageNet). Demonstrated improved performance over SOTA.
- Two papers submitted to ACL'24.

Amazon   **05/2022 - 11/2022**
Applied Scientist Intern, Large-scale Vision-Language Representation Learning   *Seattle, USA*
- Conducted empirical and theoretical analysis on understanding the impact of the modality alignment.
- Propose three instrumental regularizations to improve latent modality structures.
- Conduct extensive and comprehensive experiments on various vision-language models to show that the proposed methods consistently improve over the baselines for different model families (e.g., CLIP and ALBEF) and for different downstream applications (e.g., cross-modality retrieval, VQA, VR and etc).
- One paper accepted to CVPR'23.

IBM Research   **05/2020 - 08/2020**
Research Intern, Optimization of communication libraries for IBM clouds   *Yorktown Heights, USA*
- Developed tools to efficiently benchmark and visualize communication performance.
- Optimized parameters for message passing interface on IBM clouds.

Research Experience

University of Illinois at Urbana-Champaign (UIUC)   **Aug 2019 - Present**

Retrieval Augmented Generation   *Illinois, USA*

- Developed GPTFedRec, a federated recommendation framework leveraging ChatGPT and a novel hybrid Retrieval Augmented Generation (RAG) mechanism.
- Conducted experiments on multiple recommendation tasks with improved performance over SOTA.

Neural Architecture Search

- Developed differentiable models predicting end-to-end hardware performance of neural network architectures.
- Conducted experiments on CIFAR and ImageNet datasets on multiple hardware platforms (Edge GPUs, Edge TPUs, Mobile CPUs, and customized accelerators) with improved performance.

Multi-source Transfer Learning

- Formulated multi-source transfer learning as a bi-level optimization problem.
- Conducted experiments on multiple tasks including classification and scene understanding.

Review Services

- Conferences: NeurIPS, ICML, ICLR, ICASSP.
- Journals: Pattern Recognition.

Publications

GenAI, Multi-Modal, Foundation Models

1. Huimin Zeng, Zhenrui Yue, **Qian Jiang**, Dong Wang. "Federated Recommendation via Hybrid Retrieval Augmented Generation." Under Review for ACL'24. [Paper]
2. **Qian Jiang**, Jingjing Meng, Alireza Bagheri Garakani, Yang Jiao, Yetian Chen, Yikai Ni, Yan Gao, Yi Sun, Changyou Chen. "When Contrastive Learning Meets Bayesian Modeling: Learning Multi-Modal Representation Alignments with Noisy Data-Pairs." Under Review for ACL'24.
3. **Qian Jiang**, Jingjing Meng, Alireza Bagheri Garakani, Yang Jiao, Yetian Chen, Yikai Ni, Yan Gao, Yi Sun, Changyou Chen. "When Noises Help: Improve Text-Image Multimodal Contrastive Learning with Stochastic Label Augmentations." Under Review for ACL'24.
4. **Qian Jiang**, Changyou Chen, Han Zhao, Liqun Chen, Qing Ping, Son Dinh Tran, Yi Xu, Belinda Zeng, Trishul Chilimbi. "Understanding and Constructing Latent Modality Structures in Multi-modal Representation Learning." CVPR'23. [Paper]

Efficient ML

1. **Qian Jiang***, Xiaofan Zhang*, Deming Chen, Minh N. Do, and Raymond A. Yeh. "EH-DNAS: End-to-end hardware-aware differentiable neural architecture search." ICML'23 Workshop on Differentiable Almost Everything. [Paper] [Code]
2. **Qian Jiang**, Raymond A. Yeh, and Minh N. Do. "Multi-source transfer learning by learning to weight source tasks." Under Review for TNNLS.

Teaching Experience

University of Illinois at Urbana-Champaign   **2021-2022**

Teaching Assistant, Electrical and Computer Engineering Department   *Illinois, USA*

- ECE310: Digital Signal Processing
- ECE311: Digital Signal Processing Lab

Other Experience

University of California, Los Angeles (UCLA) **2018 Summer**
Full scholarship, Cross–disciplinary Scholar in Science and Technology (CSST) *Los Angeles, UCLA*

Israel Institute of Technology (Technion) **2017 Summer**
Full scholarship, Summer School of Engineering *Haifa, Israel*

Scholarships and Awards

- Nadine Barrie Smith Memorial Fellowship, 2022.
- C3SR (Illinois- IBM Center of Cognitive Computing Systems Research) Fellowship, 2019-2021.
- National Scholarship, China, 2018.
- Tanglixin Scholarship, China, 2017.

Relevant Coursework

- **Optimization and Statistics:** Random Processes; Introduction to Optimization; Statistical Learning Theory; Computational Inference; Information Theory; Games, Markets, and Mathematical Programming.
- **Machine Learning:** Pattern Recognition; Computer Vision; Deep Generative and Dynamical Models; Mathematical Models of Language.